EXHIBIT 5

Modern Industrial Organization

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To Janie and Jackie

Industry Structure and Performance

Merely corroborative detail, intended to give artistic verisimilitude to an otherwise bald and unconvincing narrative. —W. S. Gilbert

Theories on competitive and noncompetitive markets hold that the less competition a firm faces, the greater its *market power*: the ability to set price profitably above marginal cost. Thus, market power (and hence price and profits) should be higher in industries with substantial entry barriers that reduce actual and potential competition. Economists conduct empirical investigations to test two of the implications of these theories:

1. How much market power do particular firms (industries) exercise?
2. What are the major factors that determine market power?

For many decades, economists have conducted *structure-conduct-performance* (SCP) studies that concentrate on the second question, which concerns the relationship between market performance and market structure. Market *performance* is the success of a market in producing benefits for consumers (for example, a market is performing well if prices are near the marginal cost of production). Market *structure* consists of those factors that determine the competitiveness of a market. Market structure affects market performance through the *conduct* or behavior of firms. Traditionally, SCP researchers presume that market power or performance can be measured relatively easily, and concentrate on the relationship between performance and structure.

In contrast, many economists now believe that readily available statistics often do *not* accurately reflect either market performance or structure. They rely

on new data and techniques to better measure the degree of market power, and its relationship to market performance.

This chapter starts with a summary of the theories on the major market structures based on Chapters 3 through 7. Then, it turns to SCP research and discusses the traditional SCP studies' measures of performance and analyses of the relationship between performance and structure. The main findings are that many industries appear to depart considerably from perfect competition, yet the degree of this departure apparently is not strongly related to industry concentration (the share of sales made by the largest firms in the industry), which presumably reflects the structure of the industry. Finally, the chapter examines modern studies of market power.

Theories of Price Markups and Profits

The relationship between price, p, and marginal cost, MC, and the existence and persistence of economic profits depend on the market structure (Table 8.1). In a competitive industry composed of identical firms with free entry, price equals short-run marginal cost; short-run profits, π_{SR}, are either positive or negative; and long-run profits, π_{LR}, are zero, where capital is charged at its rental price based on the competitive return (or normal return) that capital earns in a competitive industry. Even if firms are price takers (competitive), each firm's profit equals zero in the long run only if each firm has equal access to the same technology and inputs. If some firms have lower costs than others, their profits will not be eroded completely by entry. Free entry guarantees only that the profit of the least profitable firm to enter (the marginal firm) equals zero in the long run.

In monopoly or oligopoly, price exceeds marginal cost, profit in the short run is either positive or negative, and long-run profit is either zero or positive. In monopolistic competition, price is above marginal cost and entry drives long-run profit to zero.

Based on the relationships summarized in Table 8.1, two important conclusions can be drawn. First, testing whether long-run profits are positive is a test of free entry, not of (perfect) competition. Free entry guarantees that long-run profits equal zero, but

TABLE 8.1	**Predictions Based on Market Structure**		
	$p - MC$	π_{SR}	π_{LR}
Competition	0	+ or −	0
Monopolistic competition	+	+ or −	0
Monopoly	+	+ or −	+ or 0
Oligopoly	+	+ or −	+ or 0

p = price, MC = marginal cost (short run), π_{SR} = short-run profits, and π_{LR} = long-run profits.

not that price equals marginal cost: Firms in a monopolistically competitive industry may earn zero profit even though price is above marginal cost. To determine whether price exceeds marginal cost, one must examine price data, not profit data. Second, short-run profits reveal very little about the degree of competition in an industry because, in all market structures, short-run profits can be either positive or negative.

Although Table 8.1 shows only four market structures, many more structures are possible. Moreover, for any given market structure, industries can differ substantially. For example, an oligopoly with four firms may set prices differently than one with only two firms. Generally, one would expect price-cost margins and profits to vary with the number of rivals and the size of barriers to entry. It is this generalization that provides the foundation for the SCP approach.

⦿ Structure-Conduct-Performance

Edward S. Mason (1939, 1949) and his colleagues at Harvard introduced the structure-conduct-performance (SCP) approach, which revolutionized the study of industrial organization by introducing the use of inferences from microeconomic analysis. In the SCP paradigm, an industry's *performance*—its success in producing benefits for consumers—depends on the *conduct* or behavior of sellers and buyers, which depends on the structure of the market. The *structure* in turn depends on basic conditions such as technology and the demand for a product.

Because the nature of these connections is usually not explained in detail, many economists criticize the SCP approach for being descriptive rather than analytic. George J. Stigler (1968) and others argued that economists, rather than employ the SCP approach, should use price-theory models based on explicit, maximizing behavior by firms and governments. Others suggested replacing the SCP paradigm with analyses that emphasize game theory (von Neumann and Morgenstern 1944). We discuss modern approaches later in this chapter.

Most of the earliest SCP works were case studies of an individual industry (for example, Wallace 1937). The first empirical applications of the SCP theory were by Mason's colleagues and students, such as Joe S. Bain (1951, 1956). In contrast to the case studies, these studies made comparisons across industries.

A typical SCP study has two main stages. First, one obtains a measure of performance (through direct measurement rather than estimation) and several measures of industry structure. Second, the econometrician uses cross-industry observations to regress the performance measure on various measures of structure so as to explain the difference in market performance across industries. We first discuss the measurement of performance and structure variables and then examine the evidence relating performance to structure.

Measures of Market Performance

Measures of market performance try to provide an answer to our first key question as to whether market power is exercised in an industry. Two different measures that directly or indirectly reflect the profits or the relationship of price to costs are commonly used to gauge how close an industry's performance is to the competitive benchmark: